REMARKS

Claims 22-24 and 77-81 are currently pending in the present patent application, with claims 17-21 and 76 having been cancelled. In an Office Action mailed April 25, 2002, the Examiner rejected claims 17, 20, 21, 76, 77, 79, and 80 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,201,276 B1 to Agarwal *et al.* ("Agarwal"), and rejected claims 18 and 81 under 35 U.S.C. § 103(a) as unpatentable over Agarwal. The Examiner also indicated claims 22-24 and 78 were allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

Claims 22 and 78 have been rewritten in independent form and are thus in condition for allowance. These amendments do not narrow the scope of claims 22 and 78, but merely rewrite these claims in independent form. Dependent claims 23, 24, and 78 are allowable for at least the same reasons as the corresponding independent claims 22 and 78 and because of the additional limitation added by these claims.

With regard to the remaining pending claims, in order to help the Examiner appreciate certain distinctions between these claims and the subject matter of the Agarwal reference, the Agarwal patent will now be discussed with reference to the disclosed embodiments of the present invention. Specific distinctions between the pending claims and the Agarwal reference will be discussed after the discussion of the disclosed embodiments and the Agarwal reference. This discussion of the differences between the disclosed embodiments and Agarwal reference does not define the scope or interpretation of any of the claims.

The Agarwal patent discloses a method for passivating a dielectric layer 16 to form a passivation layer 18a thereon as shown in Figures 1A and 1B. The passivation layer 18a can be formed by annealing the dielectric layer 16 in a reactive environment composed of various gaseous materials, such as nitrogen, hydrogen, ammonia, hydrazine, monomethyl hydrazine, H2 and N2, carbon tetrafluoride, CHF3, HCL, boron trichloride, and mixtures thereof, as described in Column 4, lines 49-62. The exposure of the dielectric layer 16 to the reactive atmosphere forms the passivation layer 18a to limit or stop oxygen, carbon, or other species fro transporting between the dielectric layer and an upper electrode. In another embodiment shown in Figures 2A and 2B of Agarwal, an electrically conductive lower electrode 14 is exposed to

such a reactive environment to form a passivation layer 18b thereon and an insulating dielectric layer 16 then formed on the passivation layer 18b. The passivation layers 18a, 18b are electrically insulating layers, which is not a concern in Agarwal since a dielectric layer, which is another electrically insulating layer, is being formed on the passivation layer in either case. Thus, in Agarwal when the conductive lower electrode 14 is passivated the nonconductive passivation layer 18b is formed on the lower electrode, which is fine since the dielectric layer 16 is then formed on the passivation layer. If another conductive layer was to be formed on the conductive lower electrode 14, however, the passivation layer 18b could inhibit electrical connection between the two conductive layers and form an unwanted capacitor corresponding to the electrode 14, layer 18b, and the other conductive layer. In this situation, the passivation layer 18b would need to be removed to allow proper electrical connection between the electrode 14 and other conductive layer.

Amended claim 79 recites a method of forming a capacitor including forming a capacitor plate. Forming the capacitor plate includes providing a first conductive layer in a first environment, exposing the first conductive layer to a material selected from the group consisting of B2H6, PH3, and a carbon-silicon compound, in a second environment. A second conductive layer is deposited over the first conductive layer. Agarwal neither discloses or suggests providing a first conductive layer, exposing the first conductive layer to the recited materials, and then forming a second conductive layer over the first conductive layer to form a capacitor plate. Accordingly, amended claim 79 is allowable. Dependent claims 80 and 81 recite the method of claim 79 wherein exposing the first conductive layer includes exposing the first conductive layer to a carbon-silicon compound selected from the group consisting of CH3SiH3, (CH3)3Si-Si(CH3)3, and HMDS *in situ* and *ex situ*, respectively. Agarwal neither discloses or suggest exposing a conductive layer to the recited carbon-silicon compounds, and claims 80 and 81 are thus allowable for these additional reasons.

Claims 17-21 and 76 have been cancelled, obviating the rejections of these claims. Notwithstanding the cancellation of these claims 17-21, Applicants may pursue these identical claims in a continuing patent application and have cancelled the claims herein merely to expedite allowance of the present application.

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The specification has been amended to include the patent number corresponding to an application number set forth in the specification. This amendment adds no new matter.

Note that a Revocation and Substitute Power of Attorney has previously been submitted in this application on December 6, 2001. Please direct all future correspondence to the new attorney of record (the undersigned) indicated in the Revocation and Substitute Power of Attorney.

All pending claims are in condition for allowance, and favorable consideration and a Notice of Allowance are respectfully requested. The Examiner is requested to contact the undersigned at the number listed below for a telephone interview if, upon consideration of this amendment, the Examiner determines any pending claims are not in condition for allowance.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with Markings to Show Changes Made**".

Respectfully submitted,

DORSEY & WHITNEY LLP

Paul F. Rusyn
Registration No. 42,118

PFR:asw

Enclosures:
Postcard
Fee Transmittal Sheet (+ copy)
Copy of Previously Submitted Revocation and Substitute Power of Attorney

1420 Fifth Avenue, Suite 3400
Seattle, WA 98101-4010
(206) 903-8800 (telephone)
(206) 903-8820 (fax)

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Paragraph beginning at line 4 of page 8 has been amended as follows:

Still other gases include diborane (B_2H_6); phosphine (PH_3); and carbon-silicon compounds such as methylsilane (CH_3SiH_3) and hexamethyldisilane $(CH_3)_3Si\text{-}Si(CH_3)_3$; and hexamethyldisilazane (HMDS). Additional alternate embodiments of the current invention use hydrazine (N_2H_4), monomethylhydrazine, carbon tetrafluoride (CF_4), CHF_3, HCl, and boron trichloride (BCl_3), which are also useful in passivating dielectrics, as addressed in copending application 09/114,847, now issued as U.S. Patent No. 6,201,276 B1. Also included are mixtures of any of the gases or types of gases described above. Exemplary non-plasma process parameters using these other gases include a flow rate of about 2 sccm to about 400 sccm for these gases; a flow rate of about 50 sccm to about 100 sccm for an inert carrier gas such as He or Ar; a temperature ranging from about 150 to about 600 degrees Celsius, a pressure ranging from about 50 millitorr to about 1 atmosphere (760 torr); and a process time ranging from about 50 to about 500 seconds. Again, one skilled in the art is aware that these parameters can be altered to achieve the same or a similar process.

In the Claims:

Claims 17-21 and 76 have been cancelled.

Claims 22 and 77-81 have been amended as follows:

22. (Twice Amended) A method of forming a capacitor, comprising:

forming a capacitor plate, comprising:

providing a first conductive layer in a first environment;

exposing said first conductive layer to a nitrogen free passivation gas; and

depositing a second conductive layer over said first conductive layer,[The method in claim 17,] wherein said step of providing a first conductive layer comprises providing a first conductive layer in an oxygen-free environment; and wherein said step of

exposing said first conductive layer comprises exposing said first conductive layer to a nitrogen free passivation gas in said oxygen-free environment.

5 ~~77.~~ (Amended) The method of claim ~~78~~ 4 [76] wherein the plasma comprises a selection of N_2/H_2, N_2, and NH_3 plasmas.

4 ~~78.~~ (Amended) A method of forming a capacitor, comprising:

forming a capacitor plate, comprising:

providing a first conductive layer in a first environment;

exposing the first conductive layer to a plasma in a second environment,[The method of claim 76] wherein the first conductive layer is not exposed to oxygen between being provided in the first environment and being exposed to the plasma in the second environment; and

depositing a second conductive layer over the first conductive layer.

6 ~~79.~~ (Amended) A method of forming a capacitor, comprising:

forming a capacitor plate, comprising:

providing a first conductive layer in a first environment;

exposing the first conductive layer to a material selected from the group consisting of [selection of] B_2H_6, PH_3, and a carbon-silicon compound, [CH_3SiH_3, $(CH_3)_3Si\text{-}Si(CH_3)$, HMDS, CF_4, CHF_3, HCL, BCl_3, and SiH_4 gases, and combinations thereof,] in a second environment; and

depositing a second conductive layer over the first conductive layer.

7 80. (Amended) The method of claim ~~79~~ 6 wherein exposing the first conductive layer comprises exposing the first conductive layer to a carbon-silicon compound

selected from the group consisting of [selection of B_2H_6, PH_3,] CH_3SiH_3, $(CH_3)_3Si\text{-}Si(CH_3)_3$, and HMDS[, CF_4, CHF_3, HCL, BCl_3, and SiH_4 gases, and combinations thereof] *in situ*.

8 ~~81.~~ (Amended) The method of claim ~~79~~ 6 wherein exposing the first conductive layer comprises exposing the first conductive layer to a carbon-silicon compound selected from the group consisting of [selection of B_2H_6, PH_3,] CH_3SiH_3, $(CH_3)_3Si\text{-}Si(CH_3)$, and HMDS[, CF_4, CHF_3, HCL, BCl_3, and SiH_4 gases, and combinations thereof] *ex situ*.

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